## REMARKS

### I. Status of the Claims

Claims 1-88 were originally filed and later canceled. Claims 89-124 were subsequently added. Upon entry of the present amendment, claims 93, 97-103, and 107-130 remain pending.

The pending claims are amended to recite a polypeptide comprising a HER-2/Neu fusion protein that consists of a HER-2/Neu extracellular domain (ECD) linked to a HER-2/Neu phosphorylation domain (PD) (or a fragment of the HER-2/Neu phosphorylation domain, ΔPD), to replace the previous recitation of a HER-2/Neu fusion protein comprising of a HR-2/Neu ECD fused to a HER-2/Neu PD (or ΔPD). This amendment is fully supported by the specification, such as Examples 4 and 6-11, where polypeptides comprising HER-2/Neu ECD-PD or ECD-ΔPD fusion proteins connected to various tags are disclosed. Claim 93 and 103 are also amended to recite a 90% amino acid sequence identity to a reference sequence. This percentage identity finds support in the specification, *e.g.*, on page 9, lines 27-32. Pending claims are further amended to ensure proper antecedent basis. No new matter is introduced by the present amendment.

### II. Claim Rejections

A. 35 U.S.C. §112, First Paragraph: Written Description

Claims 93, 97-103, 107-116, 121, and 124-130 were rejected under 35 U.S.C. §112, first paragraph, for alleged failure to meet the written description requirement. Applicants respectfully traverse the rejection in light of the present amendment.

The first reason of the rejection, according to the Examiner, is that the claimed fusion proteins as defined by the hybridization conditions are not described in the specification. Although Applicants disagree with the Examiner, to expedite prosecution, pending claims have been amended to delete the recitation of hybridization under specified conditions with reference polynucleotide sequences. The written description rejection on this ground is thus obviated.

As the second reason for the rejection, the Examiner also alleged that the specification fails to adequately describe the full scope of the claimed genus of nucleic acids. Specifically, the Examiner alleged that defining a claimed nucleic acid by hybridization with a reference sequence does not fully define the scope of the ECD, PD, or ΔPD, which could be as little as one amino acid in length. As amended, pending claims now recite a HER-2/Neu fusion protein that consists of an ECD and a PD (or ΔPD) and has an at least 90% amino acid sequence identity to SEQ ID NO: 6 (or SEQ ID NO:7). Because of the recited high level of sequence identity to the amino acid sequence of the direct fusion of human HER-2/Neu ECD and PD (or ΔPD), the claimed genus of polypeptides does not encompass a HER-2/Neu fusion protein that contains only a very short segment of the ECD, PD, or ΔPD.

The pending claims as amended fully comply with the requirements for written description of a chemical genus as set forth in *University of California v. Eli Lilly & Co.*, 43 USPQ2d 1398 (Fed. Cir. 1997). As described by the Federal Circuit in *Lilly*, "[a] description of a genus of cDNAs may be achieved by means of . . . a recitation of structural features common to the members of the genus . . . ." *Lilly*, 43 USPQ2d at 1406. Furthermore, the court in *Fiers v. Revel* stated that an adequate written description "requires a precise definition, such as by structure, formula, chemical name, or physical properties." *Fiers*, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Finally, the MPEP states that structural formulas provide a convenient method of demonstrating possession of specific molecules. MPEP §2163.

It is a structural property of a nucleic acid to encode a polypeptide comprising a fusion protein that has a high degree of sequence identity to a reference amino acid sequence, because the amino acid sequence of the polypeptide is directly determined by the polynucleotide sequence of the nucleic acid. Claims 93 and 103 (and hence their dependent claims) set forth narrowly defined structural features of the claimed genus of nucleic acids, *i.e.*, encoding a polypeptide comprising a HER-2/Neu fusion protein that consists of an ECD and a PD (or ΔPD) and has at least 90% identity to the amino acid sequence of SEQ ID NO:6 (or SEQ ID NO:7).

Applicants submit, therefore, that the claimed nucleic acids are thereby defined via shared structural properties and described in detail, which "clearly allow persons of ordinary skill in the art to recognize that [the applicant] invented what is claimed." *Vas-Cath Inc. v. Mahurkar*, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991). Such description is consistent with the standards set forth in *Lilly*. As such, Applicants submit the written description requirement is met and respectfully request the withdrawal of the rejections under 35 USC §112, first paragraph.

B. 35 U.S.C. §102

***1. Kipps et al.***

Claims 93, 97-103, 107-112, 117, 118, and 122 were rejected under 35 U.S.C. §102(e) for alleged anticipation by Kipps *et al.* (U.S. Patent No. 6,287,569). Applicants respectfully traverse the rejection in light of the present amendment.

To anticipate a pending claim, a prior art reference must provide all limitations of the claim. MPEP §2131. As amended, independent claims 93 and 103 are drawn to an isolated nucleic acid encoding a polypeptide comprising a HER-2/Neu fusion protein, which consists of a HER-2/Neu extracellular domain (ECD) linked to a HER-2/Neu phosphorylation domain (PD) or a fragment of PD (ΔPD), has at least 90% identity to SEQ ID NO:6 or SEQ ID NO:7, and is capable of producing an immune response in a warm-blooded animal. In contrast, Kipps *et al.* disclose a nucleic acid encoding a chimeric immunogen that comprises a full length HER-2/Neu protein. The limitation of a HER-2/Neu fusion protein consisting of an ECD linked to a PD or ΔPD is not present in the Kipps *et al.* reference. Therefore, claims 93 and 103, as well as their dependent claims, are not anticipated by Kipps *et al.* Accordingly, the anticipation rejection should be properly withdrawn.

***2. Hudziak et al.***

Claims 93, 97, 102, 103, 107, 112, 113, 117, and 118 were rejected under 35 U.S.C. §102(e) for alleged anticipation by Hudziak *et al.* (U.S. Patent No. 6,015,567). Applicants respectfully traverse the rejection in light of the present amendment.

As discussed above, to anticipate a pending claim, all claim limitations must be present in a prior art reference. Hudziak *et al.* disclose a modified HER-2/Neu protein in which its transmembrane domain is deleted. This reference, however, does not provide the limitation of a HER-2/Neu fusion protein consisting of an ECD linked to a PD (or ΔPD). As such, Hudziak *et al.* does not anticipate the pending claims. The withdrawal of the anticipation rejection on this ground is respectfully requested.

C. 35 U.S.C. §103

***1. Kipps et al. in View of Carrano et al.***

Claims 93, 99-101, 103, 109-111, and 125-129 were rejected under 35 U.S.C. §103(a) for alleged obviousness over Kipps *et al.* in view of Carrano *et al.* (U.S. Patent No. 5,962,428). Applicants respectfully traverse the rejection in light of the present amendment.

To establish a *prima facie* case of obviousness, three basic criteria must be met: first, the prior art references must teach or suggest all the claim limitations; second, there must be some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to combine the limitations; third, there must be a reasonable expectation of success in combining the limitations. MPEP §2143.

As discussed above, the Kipps *et al.* reference does not provide all limitations of independent claims 93 and 103. The Carrano *et al.* reference is cited for the purpose of providing the limitation of immunostimulatory substances and does not complement the Kipps *et al.* reference in providing all limitations of claims 93 and 103. As such, the Kipps and Carrano references together fail to provide all limitations of the pending claims. No *prima facie* case of obviousness has been established. Applicants thus respectfully request that the Examiner withdraw the obviousness rejection based on these two references.

***2. Kipps et al. in View of Krieg et al.***

Claims 93, 99-101, 103, 109-111, and 130 were rejected under 35 U.S.C. §103(a) for alleged obviousness over Kipps *et al.* in view of Krieg *et al.* (U.S. Patent No. 6,429,199). Applicants traverse the rejection in light of the present amendment.

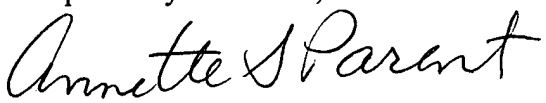
As discussed in the last section, the Kipps *et al.* reference does not provide all limitations of the pending claims. The Krieg *et al.* reference merely provides the limitation of using CpG oligonucleotides in vaccine compositions and does not supplement the missing limitation of a HER-2/Neu fusion protein consisting of an ECD and a PD (or ΔPD). The two cited references therefore do not combinedly provide all limitations of the pending claims. No *prima facie* obviousness has been established. Accordingly, Applicants respectfully submit that the obviousness rejection based on the Kipps and Krieg references is improper and should be withdrawn.

## CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



Annette S. Parent
Reg. No. 42,058

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: 415-576-0300
Attachments
ASP:cg
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